

Remarks/Arguments:

Specification:

Pursuant to Examiner's suggestion, Applicant has amended the Title of the invention to "Dynamic Cradle Assembly Positioner System For Positioning An Electronic Device Test Head."

Claim Status:

Claims 1-10 and 16-21 are pending in this application.

Claims 1 and 10 have been amended to recite a sliding member of the support structure for guiding the test head along three degrees of freedom. No new matter is being added by these amendments. According to one exemplary embodiment of the invention, a sliding member comprises the assembly of 543b, 544a, 545a, and 544b, as shown in FIG. 6B, for example. Translation of the test head along axis 547 is enabled by translation of shaft 543b through lock block 540. Rotation of the test head along tumble axis 548 and theta axis 549 is enabled by the bending of universal joints 544A and 544B (see page 17, lines 12-32 and page 19, lines 11-25).

Claim Objections:

In response to Examiner's request for further clarification on page 2 of the Office Action regarding specific terms recited in the claims, Applicant responds to Examiner's questions individually below.

According to one exemplary embodiment, the 'first lock' is referred to as a tumble lock and is represented by item number 530 in FIG. 5. The 'second lock' is an assembly referred to as a lock block which is represented by item numbers 540, 541 and 542 as shown in FIG. 5. See page 20 of the instant specification for further clarification (reproduced below).

As shown in Figure 5, for example, a tumble lock 530 may be inserted through the opening 516 in arm 515 and the slot 511 within sliding arm 510. Actuating lock 530 prevents tumble motion of arm 515 relative to sliding arm 510. Furthermore, lock shafts 543A and B must slide within lock blocks 540A and B

respectively in order to accommodate each new position, whether the motion is translation along in/out axis 547 or rotation about either theta axis 549 or tumble axis 548. In order to prevent motion in either degree of freedom, tumble locks 530A or 530B must be actuated in addition to locks 540A or 540B, or both. Otherwise, even if one of in/out locks 540A,B are actuated, tumble motion [along 548] will still result in in/out motion as connecting shaft 545 adjusts to its new position. Thus, actuating a lock 540 A,B prevents motion in two degrees of freedom, provided that a tumble lock 530A,B has also been actuated, preventing in/out translation motion [along axis 547] and theta rotation motion [along 549], as previously defined. Theta rotation is prevented because, when a lock block 540A,B is actuated, the corresponding shaft 543A,B cannot slide through lock block 540A,B and, consequently, universal joints 544A-D are prevented from further bending, thereby further preventing clockwise and counterclockwise theta rotation of the cradle motion units. This similarly prevents further in/out motion. Thus, lock 540A,B locks two degrees of freedom, one translational and one rotational, in particular in/out motion 547 and rotation about theta axis 549 simultaneously with lock 530A,B locking rotation about tumble axis 548. Thus, two locks effectively lock rotational motion about two orthogonal axes and translation motion along a third axis which is orthogonal to both rotation axes.

Claims 2-9 have been amended to recite "An apparatus."

The 'plate' recited in claim 4 refers to the cam follower block 640 shown in FIG. 6B, for example.

Claims 7 and 8 have been amended to replace the term 'load' with 'test head.'

The format of claim 10 has been amended.

Claim Rejections Under 35 U.S.C. § 112

Claims 16-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. For the purpose of clarification, an arm support block, as recited in claim 16, refers to the assembly of the cam follower block 640 and the arm 515 mounted to the cam follower block 640, as shown in FIGS. 4A-6B and described on page 13, line 29 to page 14, line 3 of the specification, for example. The guide block structure refers to the assembly of the test head attachment block 525, top guide block 520, and bottom guide block 522, as best shown in FIG. 5 and described on page 15, lines 12-22 of the specification, for example.

Claim Rejection Under 35 U.S.C. § 102(b):

Claims 1-6, 10, 20 and 21 stand rejected as being anticipated by U.S. Patent 5,450,766 to Holt. Applicant respectfully requests reconsideration of these claims and respectfully submits that these claims are patentable over Holt for the reasons set forth below.

Independent claims 1 and 10, as amended, recite features that are neither disclosed nor suggested by Holt, namely, a sliding member for guiding the test head along three degrees of freedom, and a second lock for preventing motion of the sliding member and preventing motion of the test head in two of the three degrees of freedom. Holt neither discloses nor suggests a sliding member capable of guiding the test head along three degrees of freedom. Moreover, Holt's positioner assembly 100 includes a variety of locks to control translation and rotation of the position assembly 100 along all six degrees of freedom. Each lock 14, 36, 38, 104, 114, and 144 of the test head manipulator controls a single degree of freedom of the test head. Thus, Holt neither discloses nor suggests a second lock for preventing motion of the sliding member and preventing motion of the test head in two of the three degrees of freedom.

Holt therefore fails to disclose or suggest every element of Applicant's claimed invention, as recited in claims 1 and 10. Accordingly, for the foregoing reasons, Applicant respectfully submits that independent claims 1 and 10, as amended, are patentable over Holt and should be allowed. Claims 2-9 are dependent upon claim 1, and therefore should also be allowed at least as dependent upon an allowable base claim. Reconsideration of claims 1-10 is respectfully requested.

Claims 20 and 21 recite methods of positioning a test head in a cradle motion unit, and a method of positioning a test head relative to a cradle, respectively. Holt does not disclose either of those positioning methods. Specifically, Holt teaches the steps of positioning a test head with respect to the cradle along two degrees of freedom (see Figures 9 and 10 of Holt). Holt, however, does not disclose or suggest (1) the step of positioning the test head with respect to the cradle along a third degree of freedom; and (2) the steps of actuating a lock to prevent motion of the test head **with respect to** the cradle.

Claims 16 and 18 stand rejected as being anticipated by U.S. Patent No. 5,931,048 to Slocum. It is unclear to Applicant as to whether Examiner intended to reject claims 16 and 18 in view of Holt or Slocum (see page 4 of the Office Action). Also, Examiner did not address claims 17 and 19.

Independent claim 16 recites features that are neither disclosed nor suggested by Slocum, namely, an arm support block and a guide block structure.

As described above, the term 'arm support block' refers to the assembly of the cam follower block 640 and the arm 515 mounted to the cam follower block 640, as shown in FIGS. 4A-6B and described on page 13, line 29 to page 14, line 3 of the specification, for example. The term 'guide block structure' refers to the assembly of the test head attachment block 525, top guide block 520, and bottom guide block 522, as best shown in FIG. 5 and described on page 15, lines 12-22 of the specification, for example.

As best shown in Figure 6, Slocum discloses a cradle assembly 600 comprising two side arms 604. Each side arm 604 includes a rail 612 and an automated carriage 610 that slides along rail 612. Each carriage 610 is powered by an independent motor 618. The carriages 610 are configured to translate the test head in the in/out direction and rotate the test head in the Theta rotational direction (see Figures 2 and 6 and Column 7, Line 55 to Column 8, Line 39). The test head rotates in the Nod rotational direction about the bolts 614. Nod motion is not motor driven (see column 8, lines 45-47). Slocum does not disclose or suggest an 'arm support block' or 'guide block structure' for rotating the load, as recited in claim 16.

Reconsideration of claim 16 is respectfully requested, as well as reconsideration of claim 18 by virtue of its dependency upon claim 16.

Conclusion

In view of the amendments and arguments set forth above, the above-identified application should be in condition for allowance which action is respectfully requested.

Respectfully submitted,

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Dated: April 6, 2007

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